



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification<sup>6</sup> :</b> <b>A61K 6/00, A61L 15/32, 15/40, 15/42,</b> <b>27/00, 31/00</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 98/22154</b> <b>(43) International Publication Date:</b> 28 May 1998 (28.05.98)
<b>(21) International Application Number:</b> PCT/US97/21052 <b>(22) International Filing Date:</b> 12 November 1997 (12.11.97)  <b>(30) Priority Data:</b> 08/754,818 21 November 1996 (21.11.96) US  <b>(71) Applicant:</b> TISSUE ENGINEERING, INC. [US/US]; Suite 807, 451 D Street, Boston, MA 02210 (US).  <b>(71)(72) Applicant and Inventor:</b> BELL, Eugene [US/US]; 305 Commonwealth Avenue, Boston, MA 02215 (US).  <b>(72) Inventors:</b> SIOUSSAT, Tracy, M.; 26 Boswell Road, Reading, MA 01867 (US). FOFONOFF, Timothy, W.; 1150 High Street, Dedham, MA 02026 (US).  <b>(74) Agents:</b> SILVERI, Jean, M. et al.; Lahive & Cockfield, LLP, 28 State Street, Boston, MA 02109 (US).		<b>(81) Designated States:</b> AU, CA, JP, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>  <b>(88) Date of publication of the international search report:</b> 22 October 1998 (22.10.98)
<b>(54) Title:</b> BIOPOLYMER FOAMS FOR TISSUE REPAIR AND RECONSTRUCTION  <b>(57) Abstract</b>  Single and double density biopolymer foams, composite biopolymer foams including both single and double density foams, and methods of preparing these foams and composite foams are described. Also described are biocompatible constructs which include single or double density biopolymer foams and extracellular matrix particulates and methods of preparing these constructs. The foams, composite foams, and biocompatible constructs of the invention can be used in tissue repair and reconstruction.		

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 97/21052

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A61K6/00 A61L15/32 A61L15/40 A61L15/42 A61L27/00  
A61L31/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 15818 A (TISSUE ENG INC ;BELL EUGENE (US); FOFONOFF TIMOTHY W (US)) 30 May 1996	1-14, 18-21, 23,24, 33-43, 48,51, 65, 67-70, 75,77-79
Y	see page 3, line 1 - line 26 see page 11, line 17 - line 31 see page 14, line 14 - page 15, line 3  see page 15, line 12 - line 27 see claims 1-3,6-8,10-12,14,15,19 --- -/--	16,46, 56,60, 64,76

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

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- \*O\* document referring to an oral disclosure, use, exhibition or other means
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Date of the actual completion of the international search

10 August 1998

Date of mailing of the international search report

18.08.98

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## INTERNATIONAL SEARCH REPORT

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 358 931 A (RUBINSKY BORIS ET AL) 25 October 1994 see column 1, line 44 - line 7 ---	16
Y	FR 2 657 352 A (FRANCE ETAT ARMEMENT) 26 July 1991 see page 2, line 22 - line 31 see page 5, line 1 - line 6 see page 6, line 13 - line 18 see example 2 see claims 1-3 ---	46
P,X	WO 96 39202 A (OSTEOGENICS INC) 12 December 1996 see page 32, line 12 - page 33, line 3 see page 36, line 13 - page 37, line 12 see claims 102,107,112 ---	56
X	FR 2 684 003 A (SHARROCK PATRICK) 28 May 1993 ---	57,61
Y	see page 1, line 9 - line 18  see page 3, line 36 - page 4, line 33 see claims 1,2,6 ---	59,60, 63,64
Y	US 4 553 272 A (MEARS DANA C) 19 November 1985 see column 2, line 15 - line 43 see example 2 see claims 1,2 ---	59,63
X	US 5 501 706 A (ARENBERG IRVING K) 26 March 1996 ---	57,61
Y	see column 8, line 9 - line 28 see column 9, line 8 - line 26 see claims 1-3,5,23 ---	56
Y	US 4 485 096 A (BELL EUGENE) 27 November 1984 see column 1, line 59 - line 66 see claims 28,29 -----	76

# INTERNATIONAL SEARCH REPORT

In international application No.  
PCT/US 97/21052

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-18, 25-45 (in full) and 55, 57, 59-61, 63, 64 and 71-79 (all in part)

Single density biopolymer foams, their preparation and uses.

2. Claims: 19-32, 44-54, 58, 62 (in full) and 55, 57, 59-61, and 63-79 (all in part)

Double density biopolymer foams, their preparation and uses.

3. Claims: 55, 57, 59-61, 63-70 (all in part)

Quadruple density biopolymer foams, their preparation and uses.

4. Claims: 55, 57, 59-61, 63, 64 (all in part)

Compositions containing non-specific biopolymer foams.

5. Claim : 56

A composition containing a calcium phosphate cement and extracellular matrix particulates.

6. Claims: 75-79 (all in part)

Compositions comprising single or double density foams and glandular cells.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 97/21052

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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